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Remarks

Claims 1-80 remain in the application. Claims 71-80 stand withdrawn, as being for a non-elected invention, and the Examiner is given the authority to cancel the claims that stand withdrawn by Examiner's amendment upon the allowance of all the remaining claims. Claims 1-70 remain active in the application.

Claims 1, 31, and 61 have been amended to strike the word "very" preceding the word "near" and to add clarification to the word "near" with respect to the relationship of the bottom of the screen to the top of the support structure, namely, the entire bottom of the screen being located so close to the top of the support structure that the distance from the bottom of the screen to the top of the support structure is less than that at which lateral flow of molten glass from one cell to one or more adjacent cells becomes significant to maintaining optimization of tip plate temperature profile. Basis for these amendments is found in the specification at page 4, lines 15-17 and page 31, lines 10-16. These claims have also been amended to change a plurality of tips to at least 1600 orifices with or without the same number of tips, basis being found on page 23, lines 7-10. These claims have also been amended to clarify that the bushing is a bushing for receiving molten material from a bushing leg of a glass tank, excluding bushings designed to receive glass marbles, or other solid glass shapes and for melting the solid glass in the bushing. Basis for this latter amendment can be found on page 1, lines 10-13, page 10, lines 27-29, page 11, lines 14-27 and page 13, lines 13-15.

Claims 2, 32, and 62 have been amended to define that the screen is laying on top of the support structure or a conventional screen, the conventional screen laying on the top of the support structure. Basis for this amendment can be found on page 31, lines 10-16 and page 7, lines 3-9.

Claims 3, 33, and 63 have been amended to define the bushing as having at least 1600 tips, basis being found at page 23, lines 7-10.

Figure 11 was objected to because the numeral 104 was used to identify two different items. Proposed replacement Figure 11 attached uses 118 to identify one of the

elements objected to and the number 119 to identify the other element objected to. Applicants believe that Figure is now in compliance with the Rules for drawings and respectfully requests the Examiner to withdraw the objection to the drawings.

The Specification was objected to under MPEP 608.01(b) because the Abstract was verbose. An amended Abstract is submitted above and applicants believe this Abstract meets the requirements.

The invention of the present claims is a bushing for receiving a molten material and for fiberizing the molten material, such as molten glass, comprising at least two opposed sidewalls and at least two opposed end walls, a tip plate having at at least 1600 orifices with or without the same number of hollow tips extending from a lower surface, the tip plate being attached to the sidewalls and end walls, the bushing having a boxlike shape having at least four interior corners, an interior support structure welded to a top surface of the tip plate for supporting the tip plate, the support structure forming at least 16 cells located between the bottom of a screen resting on, or mounted very near the top of, the top of the interior support structure. The interior support structure comprises a plurality of intersecting or crossing internal supports with angles between the intersecting supports at each intersection, the internal support structure, in cooperation with the at least one sidewall and the at least one end wall. The screen has a plurality of screen areas containing holes through the screen with a screen area above each of the at least 16 cells formed by the internal support structure. The hole area, per unit screen area, being different in some of the screen areas than in other screen areas to achieve more uniform tip plate temperature profile. Key features of the invention are the formation of a relatively large number of separate cells beneath the screen and then locating the screen of the invention in the bushing such that the bottom of the screen is resting on the top of the support structure, or mounted so close to the top of the support structure that the distance therebetween is less than that at which lateral flow of molten glass from one cell to one or more adjacent cells becomes significant to maintaining optimization of tip plate temperature profile, or is resting on the top of a conventional screen that is resting on the top of the support structure. The bushings of the invention advance the art by providing much better control and uniformity of temperature of the molten glass at the tip plate using these key features than had heretofore been possible using the bushings and teachings of the prior art which did not reflect any concern for lateral flow of molten glass beneath the screen.

Claims 1-70 were rejected under 35 USC 103 as being unpatentable over Harris or Stalego in view of Hanna (EP '225). The Examiner urges that both Harris and Stalego teach a bushing screen having a plurality of screen areas with the hole area per unit area of screen area being different in some areas than in other screen areas and that Stalego additionally teaches that a screen area closest to each bushing corner and end wall has a hole area per unit screen area that is substantially greater than that of the screen areas that are closest to the centerline of the screen. The Examiner acknowledges that neither Harris or Stalego teach an internal support structure attached to the tip plate that forms at least 16 cells, but that Hanna et al teach such a support structure and that it would have been obvious to have used Hanna et al's support structure in the bushings taught by either Harris or Stalego to achieve better support for the tip plate in these bushings. This rejection, and the potential rejection that it would have been obvious to have used the teachings of either Harris or Stalego re their bushing screens to have modified the bushing screen of Hanna et al such that the hole area in some screen areas above cells is different than hole areas per screen area of other screen areas, are respectfully traversed.

Harris teaches bushings having up to 800 tips receiving solid glass marbles or other solid shapes and for melting the solid glass shapes in a melting chamber 22 in the bushing and on a baffle 24. The baffle 24 has different sized holes therethrough for the purpose of improving the temperature uniformity of the tip plate. When melting glass inside the bushing, the temperature of the molten glass varies substantially more than the molten glass coming into the bushing from a bushing leg of a melting furnace. In the Harris bushing, the bottom of the baffle 24 is located a substantial distance from the top of the tip plate 15. There is no mention or suggestion in Harris of lateral or partially lateral flow of molten glass between the baffle and the tip plate, or how to prevent such flow to achieve the maximum effect of the baffle defined by Harris. Since Hanna et al teaches at col. 8, lines 45-49, that the invention makes bushings having 1600 or more orifices perform in a substantially superior manner, it is unlikely that one of ordinary skill in the art would find it obvious to apply the support structure of Hanna et al to the bushings taught by Harris. And, even if one of ordinary skill in the art would believe it obvious to use the teachings of Harris in the bushings taught by Hanna, the claimed invention would not be produced, see Figs. 2 and 2 A of Hanna et al and the figure in Harris.

Stalego, Figures 4-5, discloses a bushing for receiving molten glass from a bushing leg, but the heater strip 78 taught is corrugated or a multiple V-shaped configuration, please see col. 6, lines 35-50. These heater strip configurations taught by Stalego leave substantial distance between all of the holes in the heater strip 78 and the top of the tip plate 15 for lateral or partially lateral flow direction of the molten glass and for mixing of the molten glass coming from the various holes of different diameter, thus largely frustrating the object of Stalego, please see the present specification at page 3, lines 25-27 and page 4, lines 12-17. Nothing in the references cited suggests to one of ordinary skill in this art to modify the bushing of Stalego to produce the bushing structure claimed in this application or the claimed method of making the Stalego bushing. Also, the heater strips disclosed by Stalego have at most 6 areas of screen (Fig. 8) and only 3 areas of different hole size whereas the present invention provides the capability of having at least 16 screen areas capable of having different hole sizes, or other flow control parameters that will much more effectively influence the temperature of the tip plate than the 6 areas taught by Stalego because the entire screen is mounted on or near the support structure.

Also, please see Board of Appeals Decision, Appeal No. 2000-0035, re the reversal of previous rejections of bushing claims containing one or more screens like, or similar, to the screens used in the present invention as being unpatentable under 35 USC 102 as being anticipated by the same Stalego patent cited in this application, and as being unpatentable under 35 USC 103 as being obvious over the teachings of this same Stalego patent.

For these reasons Applicants believe the present claims are patentable under 35 USC 103 over Harris or Stalego in view of Hanna et al and respectfully requests the Examiner to withdraw this rejection and to allow all of the claims.

Claims 1, 31, and 61 stand provisionally rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 2 and 21 of co-pending application No. 08/929,836 and claims 25, 27, 29 and 31 of co-pending application No. 10/421,683. Applicants do not believe that the claimed invention is made obvious by the teachings of Stalego combined with the teachings of Hanna et al, for the reasons set out above, and neither did the Board of Appeals in the appeal of Application S.N. 08/929,836 used in this rejection. However, for different reasons, Applicants have

decided to file a Terminal Disclaimer (enclosed) stating that the term of any patent granted on the instant application which would expire beyond the expiration date of any patents granted on pending application serial Nos. 08/929,836 and 10/421,683.

Applicants believe that the enclosed Terminal Disclaimer removes any Double Patenting issues and respectfully requests the Examiner to withdraw this rejection and to allow all of the claims.

Applicant's attorney believes that the amended claims above address all of the Examiner's reasons for rejection and are now in condition for allowance. If the Examiner believes that still further changes are needed, applicant's attorney invites a telephone interview to expedite the disposal of this application.

Respectfully submitted,


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